

REMARKS

Applicants have studied the Office Action dated June 31, 2001 (paper no. 9) and have made amendments to the claims. It is submitted that the application, as amended, is in condition for allowance. By virtue of this amendment, claims 45 - 78 are pending. Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks are respectfully requested. In the Office Action, the Examiner:

- objected to claim 73 under 37 C.F.R. 1.75 as being a substantial duplicate of claim 72;
- rejected claims 45 and 57 under 35 U.S.C. § 102(b) as being anticipated by Oda et al, (U.S. 5,703,646);
- rejected claims 50, 51, 53 and 54 under 35 U.S.C. § 102(e) as being anticipated by DeJaco (U.S. 5,911,128);
- rejected claim 46 under 35 U.S.C. § 103(a) as being unpatentable over Oda (U.S. 5,702,646) in view of Kato et al (U.S. 5,675,379);
- rejected claims 47 - 48 under 35 U.S.C. § 103(a) as being unpatentable over Oda (U.S. 5,702,646) in view of Official Notice taken by Examiner;
- rejected claims 52 and 56 under 35 U.S.C. § 103(a) as being unpatentable over DeJaco (U.S. 5,911,128) in view of Kato et al (U.S. 5,675,379);
- rejected claim 55 under 35 U.S.C. § 103(a) as being unpatentable over DeJaco (U.S. 5,911,128) in view of Official Notice taken by Examiner; and
- rejected claims 58 - 71 are system claims and claims 72 - 78 are computer readable claims that parallel limitation as found in claims 45 - 57, and are rejected by the same rationale.

Overview of the Current Invention

Preferred embodiments of the present invention provide an improved method, apparatus and computer readable medium to measure the progress or rate of encoding during an encoding process. It is important to differentiate the process of selecting an algorithm and a bit rate for encoding versus

the process of measuring the progress of the encoding task itself. In other words, the present invention is directed to providing an interim measurement of how far (i.e., what percentage of completion) has the encoding progressed for the content with a selected algorithm and bit rate has progressed. This is not the same as selecting the "rate of encoding" which is the algorithm and the bit rate. The present invention helps solve problems with the "scheduling" of the successive tasks during content preparation. As stated in the Background of the present invention on page 7 (Emphasis Added):

The process to compress content can require a large amount of dedicated computational resources, especially for larger content items such as full-length feature movies. Providers of compression algorithms offer various tradeoffs and advantages associated with their compression techniques. These tradeoffs include: the amount of time and computational resources needed to compress the content; the amount of compression achieved from the original content; the desired bit rate for playback; the performance quality of the compressed content; and other factors. Using an encoding program which take as input a multimedia file and generate an encoded output file with no interim indication of progress or status is a problem. Moreover, in many circumstances, other programs are used to call or to manage an encoding program with no interim indication of progress. This leaves the calling application with no way to gauge the amount of content that has been encoded as a percentage of the entire selection of designated to be encoded. In circumstances where the calling program is trying to schedule several different programs to run at once this can be a problem. Furthermore, this can be especially burdensome in cases where batches of content have been selected for encoding and the content provider wants to determine the progress of the encoding process.

Accordingly, the present invention is directed to the measurement of the rate of encoding itself so as to determine the progress of the encoding process. The present invention is not directed to selecting the encoding rate i.e., the parameters used to set the encoding such as bit rate and the algorithm. This process is described in the present invention at pages 86 and 87 and FIG. 11 with the measured rate factor R_{CURRENT} , R_{NEW} , and R_{STORED}

where R_{NEW} = AVERAGE OF (R_{STORED} + $R_{CURRENT}$) and R_{NEW} = (length of Digital Content encoded)/(amount of time).

In order to more particularly point out and clarify these features of: measuring a rate of encoding and so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and bit rate which has been selected, the following language has been added the independent claims, i.e., claims 45, 50, 58, 63, 71, 72, and 78 as follows:

- Claims 45, 58 and 72

selecting an encoding algorithm and bit rate;

calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected.

- Claims 50 and 63

retrieving a previously calculated measured rate of encoding so as to provide an interim rate of completion for a subsequent process of encoding the content with the specific encoding algorithm and bit rate;

calculating a current measured rate of encoding for the encoding of the digital content so as to provide an interim rate of completion for encoding;and

updating the previously calculated measured rate of encoding using the current measured rate of encoding.

- Claims 57, 71 and 78

selecting an encoding algorithm and bit rate;

calculating a measured rate of encoding using the selected sample and an amount of time it took to encode the selected sample so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and bit rate which has been selected.

Objected to duplication of claims under 37 CFR 1.75

As noted above, the Examiner objected to claim 73 under 37 C.F.R.1.75 as being a substantial duplicate of claim 72. Claim 72 has been amended to distinguish claim 73. Accordingly, the Examiner's objection should be overcome.

Rejection under 35 U.S.C. §102(b) by Oda

As noted above, the Examiner rejected claims 45 and 57 under 35 U.S.C. § 102(b) as being anticipated by Oda et al, (U.S. 5,703,646). As the Examiner points out on page 3 of her Action, Oda discloses at Col. 14, Lines 28-38 (Emphasis Added) *"A picture encoding apparatus to which this invention is applied comprises, as shown in FIG. 1, for example, a first encoding circuit 10 for encoding an input video signal to generate first encoded data, an encoding control circuit 30 for determining encoding rate every predetermined time on the basis of data quantity every predetermined time of the first encoded data from the first encoding circuit 10 and total quantity of usable data, and a second encoding circuit 40 for encoding the input video signal every predetermined time on the basis of the encoding rate from the encoding control circuit 30 to generate second encoded data."* This use of "encoding rate" by Oda is directed to algorithms and bit rates or in the words of Oda *"undergo encoding e.g., predictive encoding, DCT processing, quantization at fixed quantization step size and variable length encoding to generate first encoded data to determine (calculate) allocated code quantity every frame or every GOP."* See Oda Abstract. Independent claims 45 and 57 have been amended to clarify and distinguish over Oda. In particular, Oda is not directed to the measurement of the rate of encoding itself so as to determine the progress of the encoding process. Rather, Oda is directed to selecting the encoding rate i.e., the parameters used to set the encoding such as bit rate and the algorithm. More particularly Oda nowhere describes or teaches "calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected." See Present Invention at page 86 and 87 and FIG. 11. Accordingly, independent claims 45 and 57 of the present invention distinguishes over Oda for at least this reason.

The Examiner cites 35 U.S.C. § 102(b) and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims as being anticipated by Oda.¹ The elements in independent claims 45 and 57 of "calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected" is not taught or disclosed by Oda. The Applicants respectfully submitted that the Examiner's rejection under 35 U.S.C. § 102(b) have been overcome.

Rejection under 35 U.S.C. §102(e) by DeJaco

As noted above, the Examiner rejected claims 50, 51, 53 and 54 under 35 U.S.C. § 102(e) as being anticipated by DeJaco (U.S. 5,911,128). As the Examiner points out on page 4 of her Action, DeJaco discloses at Col. 10, Lines 37 -60 (Emphasis Added). "*By multiplying each of the encoding rates by the number of frames encoded at that rate and then dividing by the total number of frames in the sample an average data rate for the sample of active speech may be computed. It is important to have a frame sample size, W, large enough to prevent a long duration of unvoiced speech, such as drawn out "s" sounds from distorting the average rate statistic. In the exemplary embodiment, the frame sample size, W, for the calculation of the average rate is 400 frames.*" This use of "encoding rate" by DeJaco is directed to algorithms and bit rates or in the words of DeJaco. "*Referring to FIG. 1, mode measurement element 12 determines values of five parameters used by rate determination logic 14 to select an encoding rate for the active speech frame. In the exemplary embodiment, mode measurement element 12 determines five parameters which it provides to rate determination logic 14. Based on the parameters provided by mode measurement element 12, rate determination logic 14 selects an encoding rate of full rate, half rate or quarter rate.*" See DeJaco FIG. 1 and Col 6., Lines 41 - 49. (Emphasis Added). Independent claim 50 has been amended to

¹ See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

clarify and distinguish over DeJaco. In particular, DeJaco is not directed to the measurement of the rate of encoding itself so as to determine the progress of the encoding process. Rather DeJaco teaches the selection of the encoding rate i.e., the parameters used to set the encoding such as bit rate and the algorithm. More particularly, DeJaco nowhere describes or teaches “calculating a current measured rate of encoding for the encoding of the digital content so as to provide an interim rate of completion for encoding.” See Present Invention at page 86 and 87 and FIG. 11. Accordingly, independent claim 50 of the present invention distinguishes over DeJaco for at least this reason.

Independent claim 50 has been amended to distinguish over DeJaco. Claims 51, 53, and 54 depend from claim 50, since dependent claims contain all the limitations of the independent claims, claims 51, 53, and 54 distinguish over DeJaco, as well.

Rejection under 35 U.S.C. §103(a) in view of Oda over Kato

As noted above, the Examiner rejected claim 46 under 35 U.S.C. § 103(a) as being unpatentable over Oda (U.S. 5,702,646) in view of Kato et al (U.S. 5,675,379). As stated in the section entitled “35 U.S.C. § 102(b) in view of Oda” independent claim 46 has been amended to clarify and distinguish over Oda. Oda taken alone or in view Kato does not suggest or teach “calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected.” The Examiner at page 5 of the Office Action points to Col. 3, lines 25-30 of Kato for support of teaching *displaying the encoding rate during the encoding of the digital content*. However careful reading of Kato discloses a “duration (display) of each GOP”. Kato is referring to pictures or GOP (Groups of Pictures) being displayed during encoding and the selection of the encoding parameters. This is not the same as “displaying the measured rate of encoding during the encoding of the digital content”. Because claim 46 is dependent upon claim 45, and since dependent claims contain all the limitations of the independent claims, claim 46 distinguishes over Oda taken alone or in view of Kato, as well.

Rejection under 35 U.S.C. §103(a) in view of Oda over Official Notice

As noted above, the Examiner rejected claim 47 - 48 under 35 U.S.C. § 103(a) as being unpatentable over Oda (U.S. 5,702,646) in view of Official Notice. As stated in the section entitled "35 U.S.C. § 102(b) by Oda" independent claim 45 has been amended to clarify and distinguish over Oda. Oda taken alone or in view Official Notice does not suggest or teach "calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected." Because claim 47 - 48 are dependent upon claim 45, and since dependent claims contain all the limitations of the independent claims, claim 47 - 48 distinguish over Oda taken alone or in view of Official Notice, as well.

Rejection under 35 U.S.C. §103(a) in view of DeJaco over Official Notice

As noted above, the Examiner rejected claims 55 under 35 U.S.C. § 103(a) as being unpatentable over DeJaco (U.S. 5,911,128) in view of Official Notice taken by Examiner. As stated in the section entitled "35 U.S.C. § 102(e) by DeJaco" independent claim 47 - 48 have been amended to clarify and distinguish over Oda. Oda taken alone or in view Official Notice does not suggest or teach "calculating a measured rate of encoding using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the encoding algorithm and bit rate which has been selected." Because claim 55 is dependent upon claim 50, and since dependent claims contain all the limitations of the independent claims, claim 55 distinguish over DeJaco taken alone or in view of Official Notice, as well.

Rejection of System Claims for Same Rationale.

As noted above, the Examiner rejected system claims 58 - 71 and computer readable medium claims 72 - 78 that parallel limitation as found in claims 45 - 57, and are rejected by the same rationale. Independent claims 45, 50, 57, 58, 63, 71, 72 and 78 distinguish over the cited art. In

view of the foregoing amendments and discussion, claims 58 - 71 and 72 - 78 distinguish over the prior art for the same reasons and should be allowable as well.

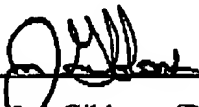
CONCLUSION

Independent claims 45, 50, 57, 58, 63, 71, 72 and 78 have been amended. All the remaining claims dependent from the amended claims. In view of the foregoing, Applicants respectfully submits that all of the grounds for rejection stated in the Examiner's office action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in condition for allowance, which allowance is respectfully requested.

PLEASE CALL the undersigned if that would expedite the prosecution of this application.

Respectfully submitted.

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MARKED-UP VERSION

45. (Once Amended) A method of [determining]measuring a[n] rate of encoding [rate] for digital content, the method comprising the steps of:

selecting an encoding algorithm and a bit rate;

encoding a selected sample of digital content for a predetermined period of time; and

calculating a[n] measured rate of encoding[rate] using the selected sample and the predetermined period of time, so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and the bit rate which has been selected.

46. (Once Amended) The method as defined in claim 45, further comprising the step of: displaying the measured rate of encoding [rate] during the encoding of the digital content.

47. (Once Amended) The method as defined in claim 45, further comprising the steps of:

storing the measured rate of encoding[rate]; and

associating the measured rate of encoding[rate] with a specific encoding bit rate and a specific encoding algorithm.

48. (Once Amended) The method as defined in claim 46, wherein the step of displaying the measured rate of encoding[rate] includes displaying the percentage of digital content encoded as compared to the total amount of digital content to be encoded.

49. The method as defined in claim 46, wherein the step of displaying the measured rate of encoding[rate] includes displaying the amount of time remaining to encode the total amount of digital content to be encoded.

50. (Once Amended) A method of [determining]measuring a[n] rate of encoding[rate] for digital content, the method comprising the steps of:

determining if a previously calculated measured rate of encoding has been stored for a specific encoding algorithm and a bit rate and if the previously calculated measured rate of encoding is stored then performing the sub-steps of:

retrieving a previously calculated measured rate of encoding[rate] so as to provide an interim rate of completion for a subsequent process of encoding the content with the specific encoding algorithm and the bit rate;

encoding digital content;

calculating a current measured rate of encoding[rate] for the encoding of the digital content so as to provide an interim rate of completion for encoding; and

updating the previously calculated measured rate of encoding[rate] using the current measured rate of encoding[rate].

51. (Once amended) The method as defined in claim 50, wherein the step of [retrieving a previously calculated encoding rate correspond to a specific encoding bit rate and a specific encoding algorithm]determining if a previously calculated measured rate of encoding has been stored for a specific encoding algorithm and a bit rate and if the previously calculated measured rate of encoding is not stored then performing the sub-steps of:

selecting an encoding algorithm and a bit rate;

encoding a selected sample of digital content for a predetermined period of time;

calculating a measured rate of encoding using the selected sample and the predetermined period of time; and

storing the measured rate of encoding.

52. (Once Amended) The method as defined in claim 50, further comprising the step of using the previously calculated measured rate of encoding[rate] for displaying the measured rate of encoding[rate] during the encoding of the digital content.

53. (Once Amended) The method as defined in claim 50, wherein the step of updating the previously calculated rate of encoding[rate] includes the sub-steps of:

averaging the previously calculated measured rate of encoding[rate] and the current measured rate of encoding[rate]; and

storing the [average]measured rate of encoding[rate] which has been averaged as a new value for the previously calculated measured rate of encoding[rate].

54. (Once Amended) The method as defined in claim 50, wherein the step of updating the previously calculated measured rate of encoding[rate] includes the sub-steps of:

averaging the previously calculated measured rate of encoding[rate] and the current measured rate of encoding[rate]; and

storing the average measured rate of encoding[rate] as a new value for the previously calculated measured rate of encoding[rate] if the measured rate of encoding[rate] does not deviate from the previously calculated measured rate of encoding[rate] by a configured threshold.

55. (Once Amended) The method as defined in claim 53, wherein the sub-step of storing the average measured rate of encoding[rate] includes associating the previously calculated measured rate of encoding[rate] with a specific encoding bit rate and a specific encoding algorithm.

56. (Once Amended) The method as defined in claim 50, further comprising the step of displaying the measured rate of encoding[rate] during the encoding of the digital content.

57. (Once Amended) A method of [determining] measuring a[n] rate of encoding [rate] for digital content, the method comprising the steps of:

selecting an encoding algorithm and a bit rate;

encoding a selected sample of digital content; and

calculating a[n] measured rate of encoding [rate] using the[a] selected sample and [the]an amount of time it took to encode the selected sample so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and a bit rate which has been selected.

58. (Once Amended) A system for [determining]measuring a[n] rate of encoding [rate] for digital content, the system comprising:

a receiver for receiving digital content to be encoded;

an encoder for encoding a selected sample of the digital content for a predetermined period of time using an encoding algorithm and bit rate; and

means for calculating a[n] measured rate of encoding[rate] using the selected sample of digital content and the predetermined period of time so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and the bit rate.

59. (Once Amended) The system as defined in claim 58, further comprising a display for displaying the measured rate of encoding[rate] during the encoding of the digital content.

60. (Once Amended) The system as defined in claim 58, further comprising:

storage for storing the measured rate of encoding[rate]; and

means for associating the measured rate of encoding[rate] with a specific encoding bit rate and a specific encoding algorithm.

61. The system as defined in claim 59, further comprising means for displaying the percentage of digital content encoded as compared to the total amount of digital content to be encoded.

62. The system as defined in claim 59, further comprising means for displaying the amount of time remaining to encode the total amount of digital content to be encoded.

63. (Once Amended) A system for [determining]measuring a[n] rate of encoding [rate] for digital content, the system comprising:

means for retrieving a previously calculated measured rate of encoding[rate] so as to provide an interim rate of completion for a subsequent process of encoding the content with a specific encoding algorithm and a bit rate;

an encoder for encoding digital content;

means for calculating a current measured rate of encoding[rate] of the digital content;

and

means for updating the previously calculated measured rate of encoding[rate] based on the current measured rate of encoding[rate].

64. (Once Amended) The system as defined in claim 63, wherein the means for retrieving a previously calculated measured rate of encoding[rate] includes means for associating the previously calculated encoding rate with a specific encoding bit rate and a specific encoding algorithm.

65. (Once Amended) The system as defined in claim 63, further comprising a display for displaying the measured rate of encoding[rate] during the encoding of the digital content using the previously calculated measured rate of encoding[rate].

66. (Once Amended) The system as defined in claim 63, wherein the means for updating the previously calculated measured rate of encoding[rate] comprises:

means for averaging the previously calculated measured rate of encoding[rate] and the current measured rate of encoding[rate]; and

storage for storing the previously averaged encoding rate as the previously calculated encoding rate.

67. (Once Amended) The system as defined in claim 63, wherein the means for updating the previously calculated measured rate of encoding[rate] comprises:

means for averaging the previously calculated measured rate of encoding[rate] and the current measured rate of encoding[rate] if the current measured rate of encoding[rate] does not deviate from the previously calculated measured rate of encoding[rate] by the configured threshold; and

storage for storing the previously averaged measured rate of encoding[rate] as the previously calculated measured rate of encoding[rate].

68. (Once Amended) The system as defined in claim 66, wherein the storage includes means for associating the previously calculated measured rate of encoding[rate] with a specific encoding bit rate and a specific encoding algorithm.

69. The system as defined in claim 65, wherein the display includes means for displaying the percentage of digital content encoded as compared to the total amount of digital content to be encoded.

70. The system as defined in claim 65, wherein the display includes means for displaying the amount of time remaining to encode the total amount of digital content to be encoded.

71. (Once Amended) A system for [determining]measuring a[n] rate of encoding [rate] for digital content, the system comprising:

a receiver for receiving digital content to be encoded;

an encoder for encoding a selected sample size of the digital content; and

means for calculating a[n] measured rate of encoding rate using the selected sample size of digital content and the period of time it took to encode the selected sample size of digital content so as to provide an interim rate of completion for a subsequent process of encoding the content with an algorithm and a bit rate which has been selected..

72. (Once amended) A computer readable medium containing program instructions for determining an encoding rate for digital content, the program instructions comprising instructions for:

selecting an encoding algorithm and a bit rate;

encoding a selected sample of digital content for a predetermined period of time; and

calculating a[n] measured rate of encoding[rate] using the selected sample and the predetermined period of time so as to provide an interim rate of completion for a subsequent process of encoding the content with the algorithm and the bit rate which has been selected.

73. (Once Amended) The computer readable medium in claim 72 wherein in the step of calculating further comprising[the instruction for.

encoding a selected sample of digital content for a predetermined period of time; and]

calculating a[n] measured rate of encoding[rate] R_{CURRENT} using a length of the selected sample [and]divided by the predetermined period of time.

74. (Once Amended) The computer readable medium in claim 72 further comprising the instruction for displaying the measured rate of encoding[rate] during the encoding of the digital content.

75. (Once Amended) The computer readable medium in claim 72 further comprising the instruction for:

storing the measured rate of encoding[rate]; and

associating the measured rate of encoding[rate] with a specific encoding bit rate and a specific encoding algorithm.

76. (Once Amended) The computer readable medium in claim 74, wherein the instruction for displaying the measured rate of encoding[rate] includes displaying the percentage of digital content encoded as compared to the total amount of digital content to be encoded.

77. (Once Amended) The computer readable medium in claim 74, wherein the instruction for displaying the measured rate of encoding[rate] includes displaying the amount of time remaining to encode the total amount of digital content to be encoded and displaying the amount of time remaining to encode the total amount of digital content to be encoded.

78. (Once Amended) A computer readable medium containing program instructions for [determining]measuring a[n] rate of encoding[rate] for digital content, the program instructions comprising instructions for:

encoding a selected sample of digital content; and

calculating an encoding rate using a selected sample size and the amount of time it took to encode the selected sample so as to provide an interim rate of completion for a subsequent process of encoding the content with an algorithm and a bit rate which has been selected.